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Research Article

Medicinal plants with preventive and therapeutic effect on diarrhoea: A cross-sectional epidemiologic and ethnobotanical study in traditional therapists of Shahrekord, south-west of Iran

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Abstract

Chemical treatments for diarrhoea usually lead to side effects, so humans are seeking out a safe pharmaceutical source to cure them. From ancient times, medicinal plants have served as an important pharmaceutical source for the treatment of various acute and chronic diseases and infectious and non-infectious diseases. This study was carried out from April 2017 to February 2018 by interviewing with and administering a questionnaires to 29 traditional therapists. The questionnaire also included demographic items. The interviewers referred to the participants in person and asked them certain questions to elicit their beliefs about herbal medicine. Data were finally analyzed by the Excel software. In this study, the frequency of plant use was calculated by using a formula. According to the ethnobotanical knowledge of the region under study, *Astragalus hamosus* L., *Ziziphora taurica* M.Bieb., *Anthemis hyalina* DC., *Plantago major* L., *Quercus brantii* Lindl., *Myrtus communis* L., *Satureja bachtiarica* Bung., *Glycyrrhiza glabra* L., *Peganum harmala* L., *Rheum ribes* L., *Rumex pulcher* L., *Artemisia absinthium*, *Descurainia sophia* (L.) Prantle., *Plantago major* L. and some others medicinal plants are used as antidiarrhoeal medicinal plants. Most plant species reported belong to the Asteraceae family and the aerial part (36%) is the most frequently used plant organ for cases of diarrhoea in Shahrekord. The scientific registration and review of the written and non-written knowledge of different ethnicities in Iran regarding traditional medicine will help preserve the valuable treasure of thousands of years of Iranians' medical knowledge and experience and will provide the basis for the discovery of new drugs and the progress of the pharmaceutical industry.

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Introduction

Diarrhoea remains the leading cause of death in children under the age of five (1, 2). The main impact of diarrhoeal diseases is observed in

developing countries. Each child develops diarrhoea six or seven times on average each year (3). Diarrhoea-accompanying diseases affect children's health substantially (4). Diarrhoea is one of the ways of the body to kill germs and often lasts

from a few days to a week; diarrhoea often involves fever, nausea, vomiting, and dehydration. The causes of diarrhoea are usually viral, bacterial or parasitic infections affecting the digestive tract (5, 6). Shortage of water and lack of observing health principles, lack of education and personal hygiene, malnutrition and immune disorder due to HIV are major causes of diarrhoeal disease in developing countries (6). About 1.5 to 5 billion cases of diarrhoea occur annually. The disease is more prevalent in developing countries. In these countries, children get diarrhoea on average 5 times a year (4-6).

Several over-the-counter medications can help treat diarrhoea. Medications such as bismuth (Pepto-Bismol), atopolgate (Kaopectate) and loperamide (Imodium) can help reduce the symptoms of diarrhoea without curing the disease (5, 6). Chemical treatments for diarrhoea usually lead to side effects, so humans are seeking out a safe pharmaceutical source to cure them. From ancient times, medicinal plants have served as an important pharmaceutical source for the treatment of various acute and chronic diseases and infectious and non-infectious diseases (7-18).

Medicinal herbs are herbs that contain one or more organs containing the active ingredient. Medicinal herbs are used to treat a variety of diseases. They have therapeutic, control and preventive effects. One of the controversial issues regarding medicinal plants is indigenous knowledge. This knowledge is very extensive and includes a variety of aspects, including the ethnobotany of medicinal plants. Ethnobotany refers to the knowledge of human about the botany and ecology of plants. In this ethnobotanical study, the medicinal plants effective on children diarrhoea according to the indigenous knowledge of people in traditional therapists Shahrekord were investigated.

Materials and methods

Procedure for collecting indigenous knowledge about phytotherapy in Shahrekord

Type of study

This cross-sectional, ethnobotanical study was done by collecting indigenous knowledge of traditional therapists in Shahrekord (Fig. 1) using a questionnaire to identify medicinal plants in the region with anti-diarrhoeal effects in children. This study was carried out from April 2017 to February 2018 by interviewing with and administering a questionnaire to 29 traditional therapists in Shahrekord.

Area of study

Shahrekord is the highest city in Iran. Shahrekord is one of the western cities of Iran and is the capital of Chaharmahal and Bakhtiari province. Shahrekord has a population of 169199 people.

The language of the people is Persian and Shahrekord has a temperate semi-humid climate with mild summers and very cold winters. The average annual temperature in the Kurdish city is 15°C, which is four and a half degrees below the global average. The coldest and warmest months of the month are Shahrekord in January and August respectively.

How to gather traditional information and knowledge

The questionnaires also included demographic information. The interviewers referred to the participants in person and asked them certain questions to elicit their beliefs about herbal medicine. Out of 29 respondents, 8 were female and 21 male. Their education level was from high school diploma to a master degree. The data drawn from the questionnaires were tabulated in the same way. Data were finally analyzed by the Excel software. In this study, the frequency of plant use was calculated by the following formula.

$$\text{Number of times the plant is used} = \frac{\text{Number of people who have mentioned the plant effect}}{\text{total number of people who filled out questionnaires}} \times 100$$

Results

The analysis of data drawn from the questionnaires shows that according to the ethnobotanical knowledge in the region under study, 21 species of medicinal plants including *Astragalus hamosus* L., *Ziziphora taurica* M.Bieb., *Anthemis hyalina* DC., *Plantago major* L., *Quercus brantii* Lindl., *Myrtus communis* L., *Satureja bachtiarica* Bung., *Glycyrrhiza glabra* L., *Peganum harmala* L., *Rheum ribes* L., *Rumex pulcher* L., *Artemisia absinthium*, *Descurainia sophia* (L.) Prantle., *Plantago major* L. and some other medicinal plants are used as anti-diarrhoeal medicinal plants. Additional information on anti-diarrhoeal medicinal plants is shown in Table 1.

The results of data analysis are shown in Table 1 and are illustrated in Fig. 2 and 3. Most plant species reported (n=5) belong to the Asteraceae family and the aerial part (36%) is the most frequently used plant organ for cases of diarrhoea in Shahrekord (Fig. 2).

Discussion

Most plant-derived drugs have been obtained through the study of traditional therapies and indigenous knowledge of the ancient tribes, and despite the enormous advances in the synthesis of synthetic compounds, some of these compounds are still irreplaceable (19-23). Ethnobotany deals with the study of the use of plants by the people of a certain tribe or a community and is known as an effective means to draw indigenous knowledge

Table 1. The scientific name, family, Persian name, used organ(s), and frequency of use of medicinal plants used as antidiarrhoeal agents in Shahrekord

Scientific name	Family	Local name	Frequency of use	Voucher specimens	Organs used	Effect
<i>Astragalus hamosus</i> L.	Fabaceae	Nakhonak	6%	346	Aerial organs	Anti-diarrhoea
<i>Ziziphora taurica</i> M.Bieb.	Lamiaceae	kakouti	6%	426	Aerial organs	Anti-diarrhoea
<i>Anthemis hyalina</i> DC.	Asteraceae	babouneh	31%	238	Flower	Anti-diarrhoea
<i>Plantago major</i> L.	Plantaginaceae	Barhang	13%	328	Aerial organs	Anti-diarrhoea
<i>Quercus brantii</i> Lindl.	Fagaceae	Balout	41%	135	Fruit	Anti-diarrhoea
<i>Myrtus communis</i> L.	Myrtaceae	Mord	6%	176	Leaf, stem	Anti-diarrhoea
<i>Satureja bachtiarica</i> Bunge	Lamiaceae	Marzeh kouhi	6%	159	Aerial organs	Anti-diarrhoea
<i>Glycyrrhiza glabra</i> L.	Fabaceae	Shirin bian	3%	171	Root	Anti-diarrhoea
<i>Peganum harmala</i> L.	Zygophyllaceae	Espan	3%	178	Seed, leaf	Anti-diarrhoea
<i>Rheum ribes</i> L.	Polygonaceae	Rivas	3%	130	Stem, leaf	Anti-diarrhoea
<i>Rumex pulcher</i> L.	Polygonaceae	Torshak	3%	95	Aerial organs	Anti-diarrhoea
<i>Artemisia absinthium</i> L.	Asteraceae	Afsantin	3%	291	Aerial organs	Anti-diarrhoea
<i>Descurainia sophia</i> (L.) Webb ex Prantl	Brassicaceae	Khakshir	6%	282	Seed	Anti-diarrhoea
<i>Vitis vinifera</i> L.	Vitaceae	Angour	3%	237	Leaf, fruit	Anti-diarrhoea
<i>Artemisia annua</i> L.	Asteraceae	Dermaneh	3%	413	Aerial organs	Anti-diarrhoea
<i>Achillea wilhelmsii</i> C. Koch.	Asteraceae	Berenjas	10%	444	Aerial organs	Anti-diarrhoea
<i>Pistachia atlanta</i> Desf.	Anacardiaceae	Pesteh kouhi	3%	437	Fruit	Anti-diarrhoea
<i>Prangos ferulacea</i> L.	Apiaceae	Jashir	13%	428	Leaf, stem, seed	Anti-diarrhoea
<i>Plantago major</i> L.	Plantaginaceae	Asfarzeh	3%	456	Aerial organs	Anti-diarrhoea
<i>Echinophora platyloba</i> DC.	Apiaceae	Khosarizeh	3%	146	Aerial organs	Anti-diarrhoea
<i>Tanacetum polycephalum</i> (L.) Schultz Bip.	Asteraceae	Mokhalaseh	3%	111	Leaf, stem	Anti-diarrhoea

about the uses of plants. Over the past decade, the purposeful study of native pharmacopoeias aimed to produce new drugs has been given priority in the agenda of many national and international organizations. The positive approach of scientists and the increased tendency of governments to collaborate with ethnobotanical projects indicates the growing value of the data obtained from these studies. Medicinal herbs and natural and mineral medicinal compounds are used for therapeutic purposes in digestive diseases and diarrhoea (24-26). In addition, these medicinal plants used to treat diarrhoea need to be identified correctly, and advanced scanning electron microscopy is recommended (27-31). The scientific registration and review of the written and non-written

knowledge of different ethnicities in Iran regarding traditional medicine will help preserve the valuable treasure of thousands of years of Iranians' medical knowledge and experience and will provide the basis for the discovery of new drugs and the progress of the pharmaceutical industry.

The main treatment for diarrhoea involves the supply of water and electrolytes. Some herbs are water-absorbing and help to treat diarrhoea. Medicinal herbs also help treat infectious diarrhoea because of its antimicrobial properties. Also, some herbs have anti-protozoic and antiviral properties and eliminate parasitic and viral agents in diarrhoea. Others have tannins and pectins that

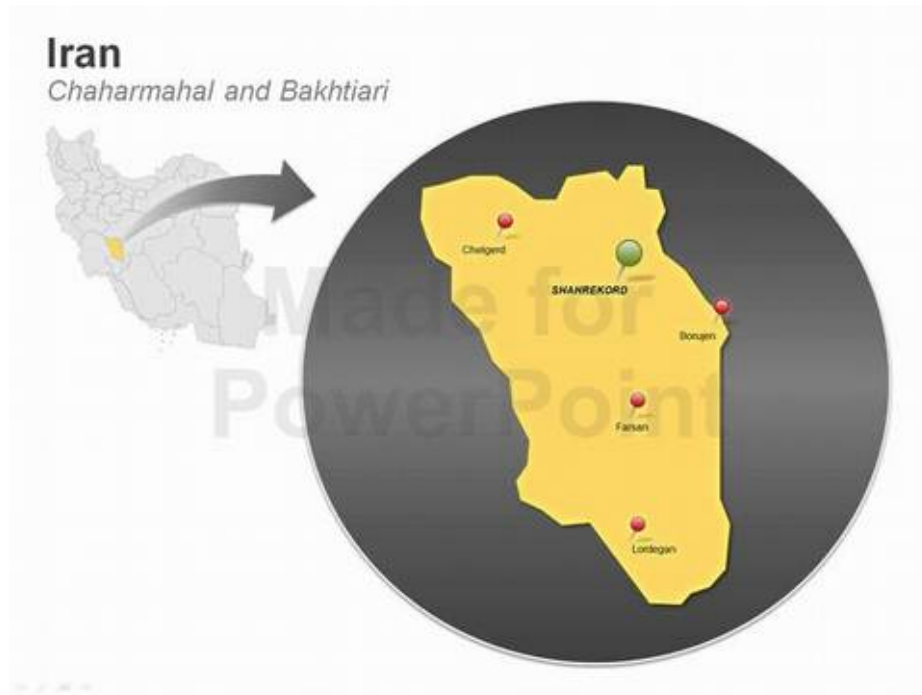


Fig. 1. Map of Shahrekord city

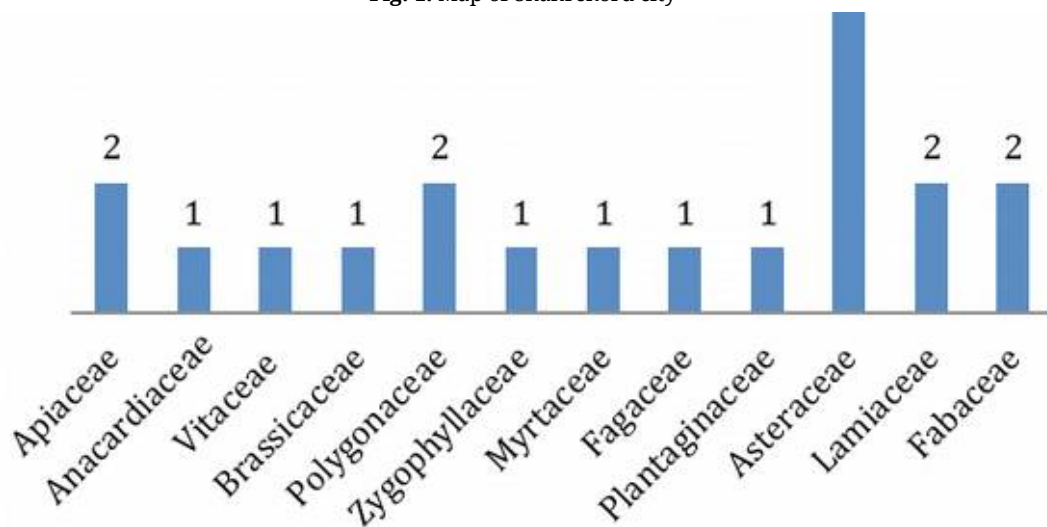


Fig. 2. The distribution of antidiarrhoeal plant families in Shahrekord

help treat diarrhoea. Others also play an important role in improving diarrhoea by strengthening the immune system and increasing the body's level of natural antibodies. Other mechanisms of medicinal herbs to improve diarrhoea are to reduce bowel movement, which, by reducing bowel movement, increases water absorption in the body than before (32-35).

Conclusion

Based on the ethno-botanical knowledge in the region can be used as anti-diarrhoea. The anti-diarrhoea effects of some of these plants have already been reported. Regarding the difference in the ethno-botany of medicinal plants between the people of Shahrekord and those of other regions across Iran and different uses of different medicinal plants, as well as the availability of certain medicinal plants in the studied area, our findings on the knowledge of the indigenous people in Shahrekord about the use of

medicinal plants may be useful. Therefore, if this therapeutic approach is chosen, the side effects of the

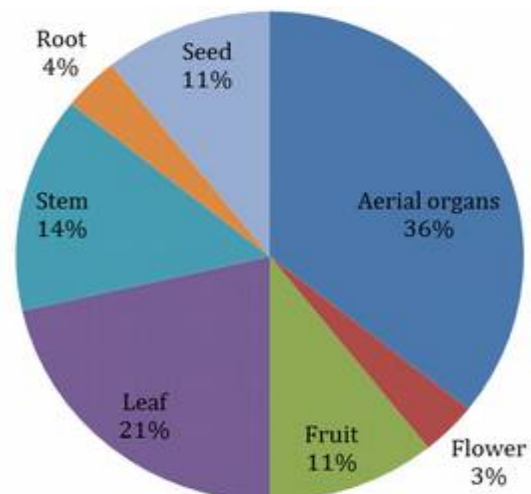


Fig. 3. The percentage of the use of plant organs for their antidiarrhoeal effect in Shahrekord

plant(s) must be taken into account because medicinal plants are not completely harmless and their efficacy has not yet been definitely approved. Therefore, they should be investigated in well-designed clinical trials.

Conflicts of interest

The authors declare no conflict of interest.

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Authors' contributions

All the authors contributed equally to the work presented in this paper.

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